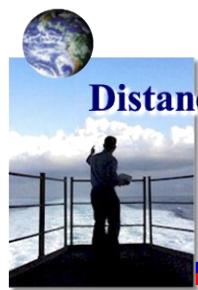


**Anchor Desk**  
*I need to . . .*

# ***Distance Support Bandwidth Mitigation***

---

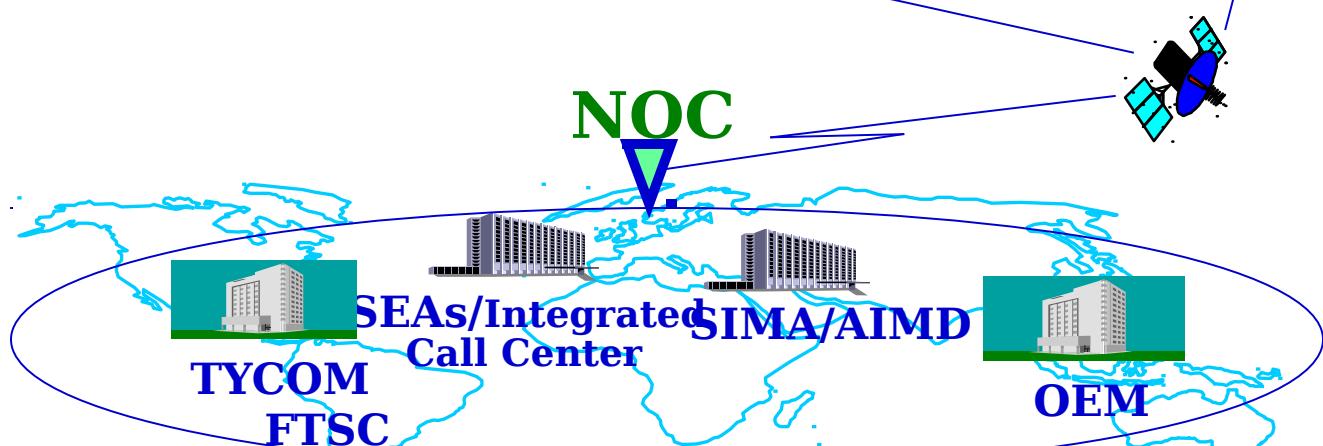
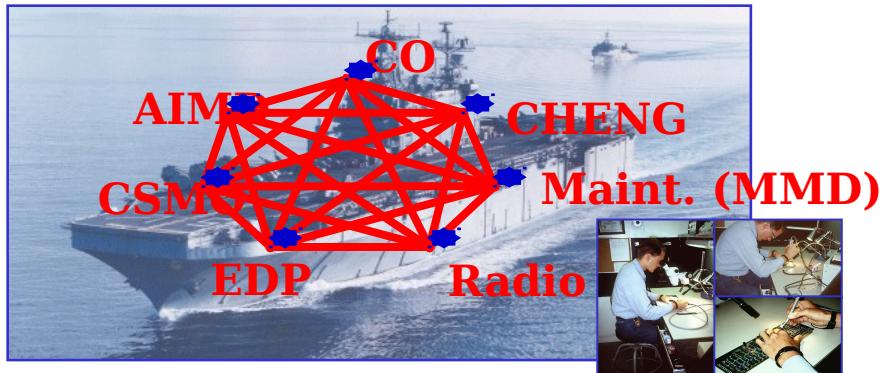
## **FLSIC Meeting**

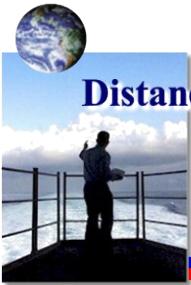


**Anchor Desk**  
I need to ...

# The Bandwidth Challenge

## "Four Problem Areas"





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**Anchor Desk**

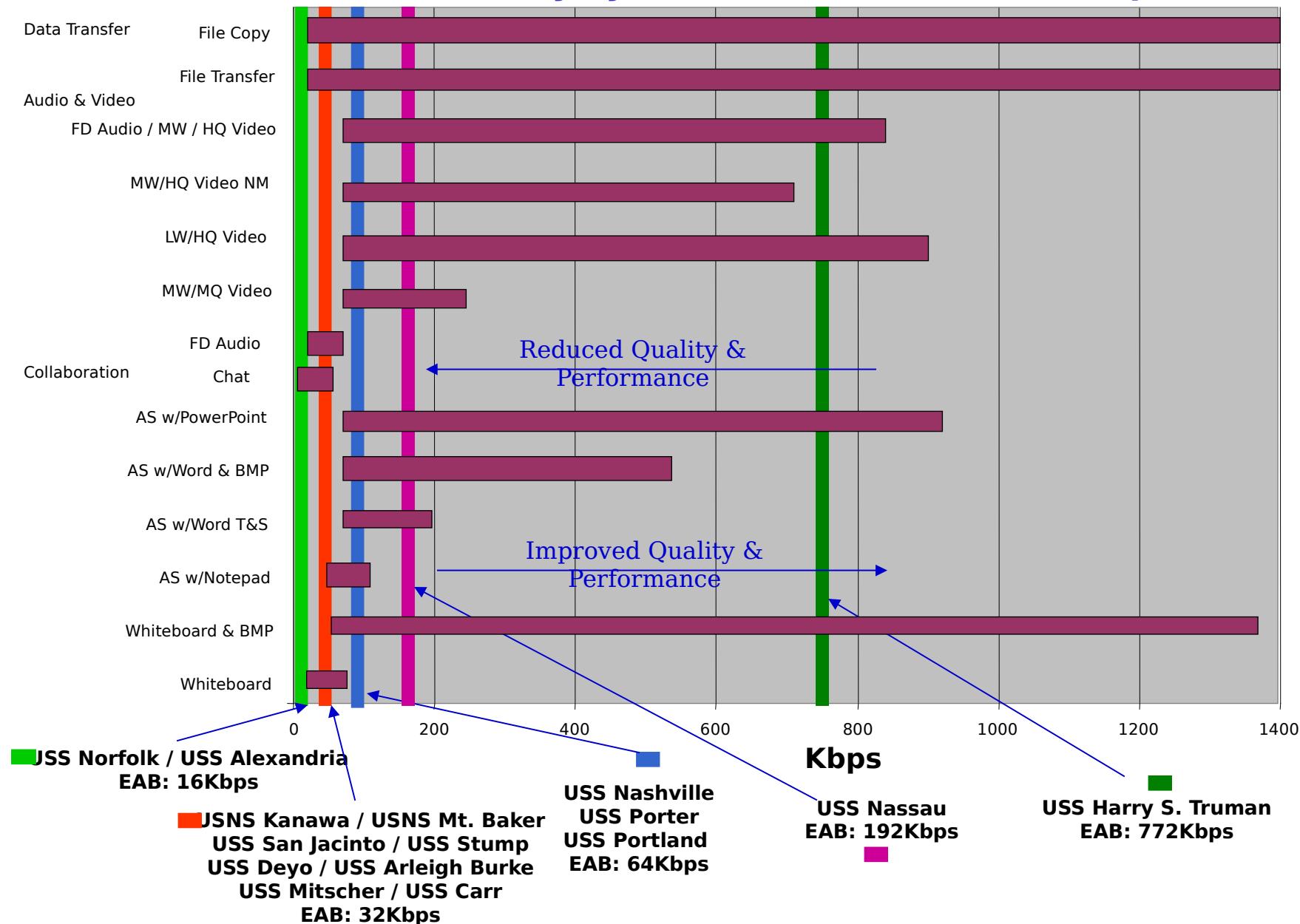
I need to . . .

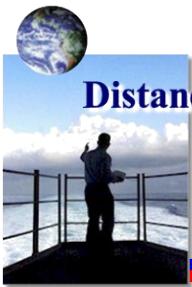
# The Issues

- Ship to Ship & Ship to Shore
  - ◆ Network capacity varies greatly by ship type
  - ◆ No Logistics dedicated band
    - Shared leftover
    - Growing competition for bandwidth
  - ◆ Stable continuous connectivity
    - Satellite footprint
    - Antenna blockage
- Intra-Ship
  - ◆ Stable connectivity Off-Ship
    - Enclaves of local area networks
    - Indiscriminate Blockage at ADNS
      - ◆ FIFO queuing
- Shore to Shore
  - ◆ Network capacity varies by location
  - ◆ Mobile coverage

# USS Harry S Truman Battle Group

## Bandwidth Availability by Platform and Functional Requirements





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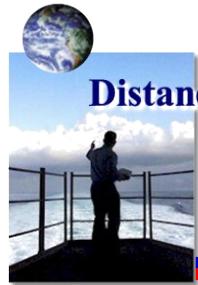
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**Anchor Desk**

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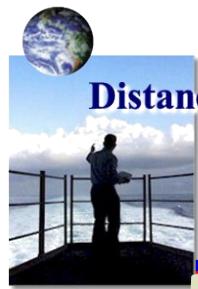
# DS Approach

- The approach resolve bandwidth issues in order of severity
  - ◆ Ship to Ship and Ship to Shore
  - ◆ Intra-ship
  - ◆ Shore to Shore
- The approach addresses management of Information, Transactions and Collaboration
- The approach focus on Bandwidth Mitigation by:
  - ◆ Minimizing the transport of data by:
    - Ship Platform resident Data (80/20 rule)
    - Process Changes
    - Local area processing
    - Auto update and synchronization
    - Data compression
  - ◆ Providing control and flexibility to adapt with:
    - Bandwidth application management
    - Off-line data capture and collaboration control



# Enabling Technologies

- **Data Updates and Transfers (Computer to Computer)**
  - ◆ **iORA (Auto update and synchronization)**
  - ◆ **Magic-E (Data compression manager)**
    - **Bandwidth Compression Pilot**
  - ◆ **Galaxy (Data compression)**
- Data Capture / Conversation (Collaboration)
  - ◆ RTASS (Collaboration manager)
- Data Transport Management
  - ◆ BMAC (Bandwidth application management)
  - ◆ Ask Jeeves (Intelligent Search)



**Distance Support**

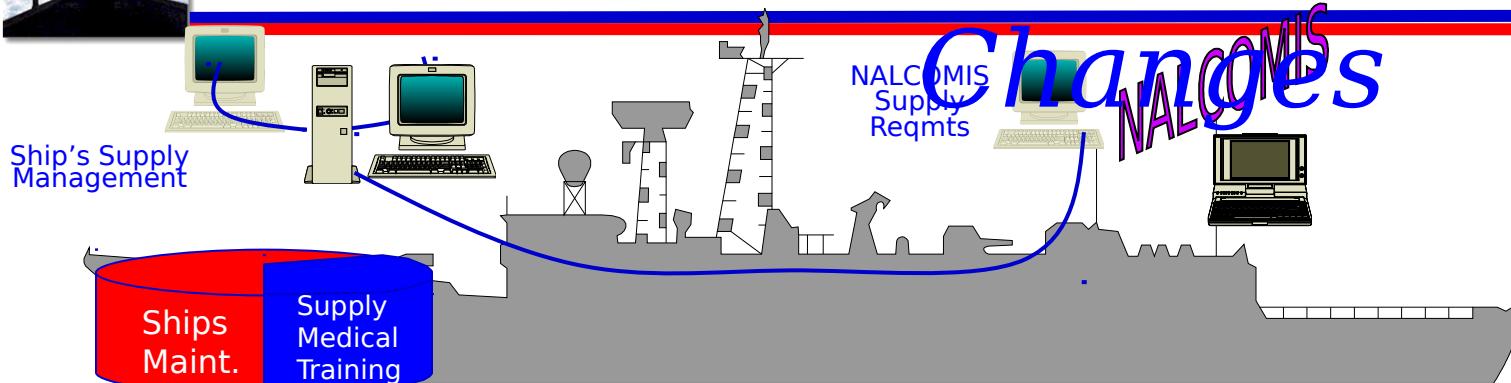
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# Platform Resident Data & Process

## Changes

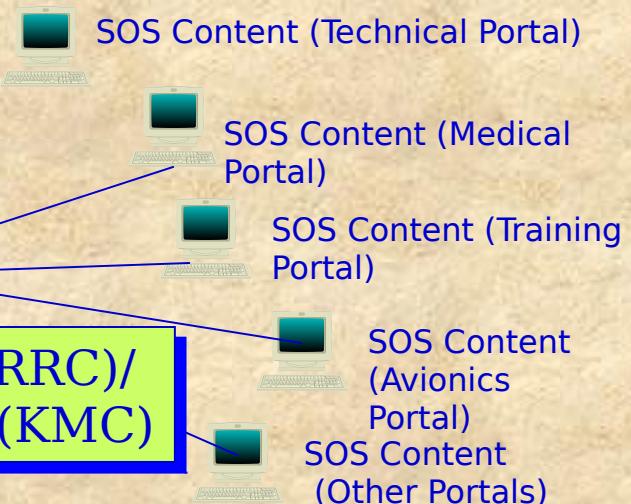


Replication of  
Transactions  
In-port

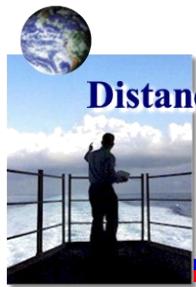
Replication of  
Transactions

**Shore Based Activities**

Readiness Response Center (RRC)/  
Knowledge Management Ctr (KMC)



Source of Support Porta

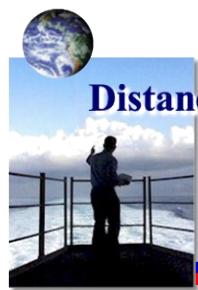


**Anchor Desk**  
*I need to . . .*

# *Auto Update and Synchronization*

## iORA

- Bandwidth mitigation tool
  - ◆ Transparent to Users
  - ◆ Provides high speed updates and data transmission
  - ◆ Reduced file and packet size (**10 to 100 times**)
  - ◆ Utilizes Epsilon compression to further reduce file size
  - ◆ Intelligent download
    - Files are downloaded in the background when a connection is established
  - ◆ Auto Update
    - iORA checks and downloads only new amendment file at connection

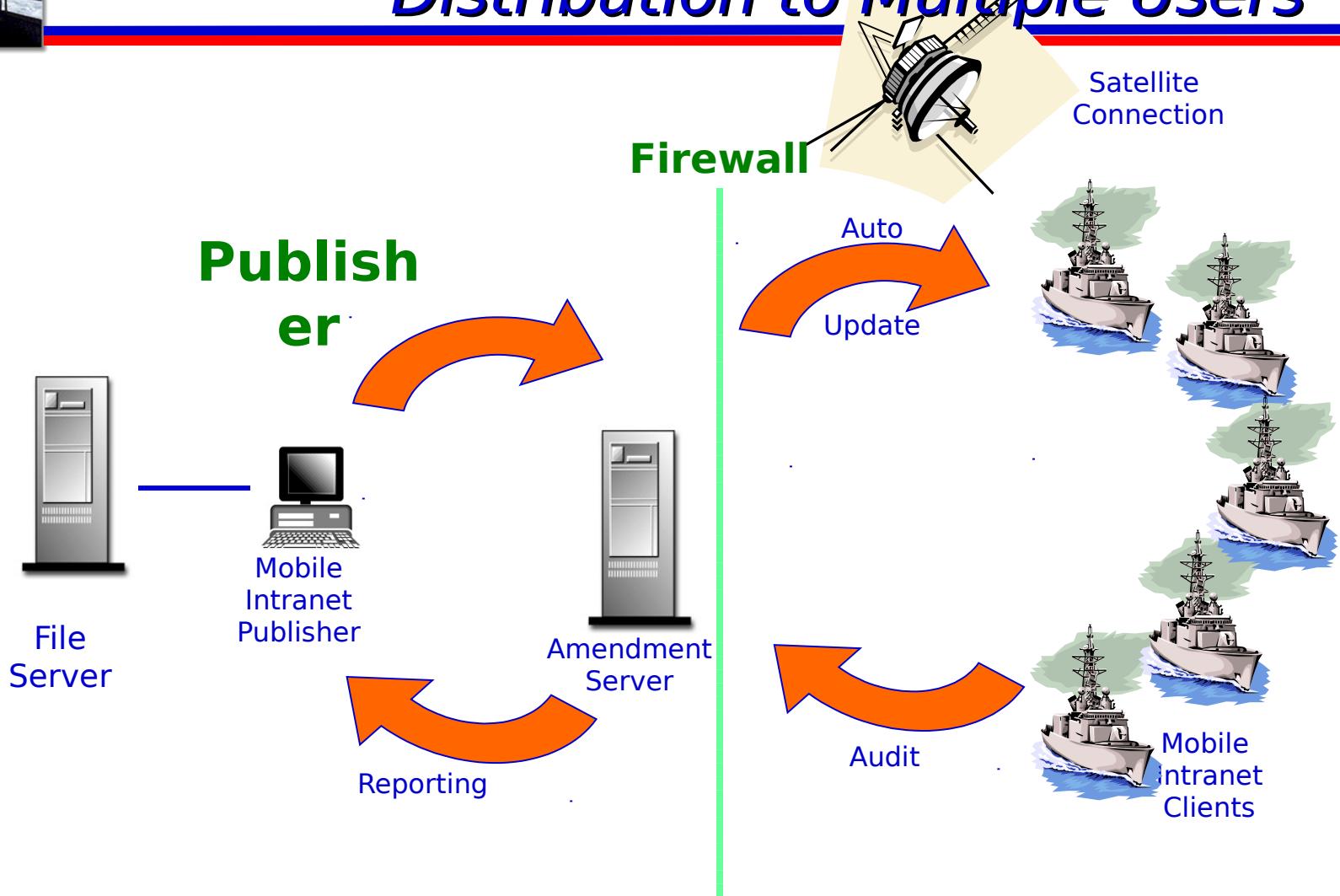


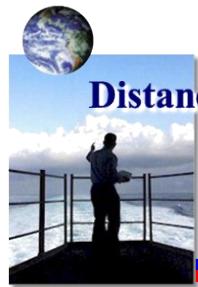
**Anchor Desk**  
*I need to ...*

# *Auto Update and*

# *Synchronization*

## *Distribution to Multiple Users*



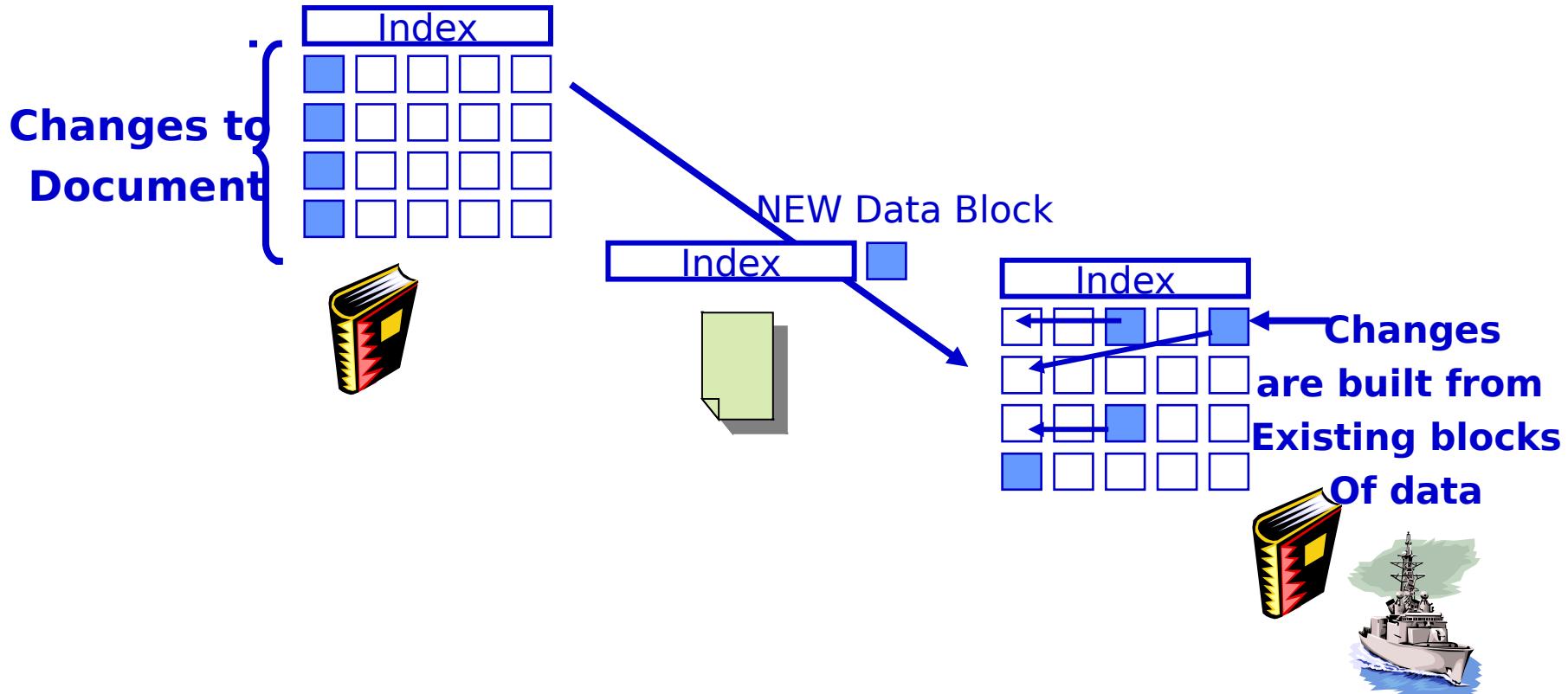


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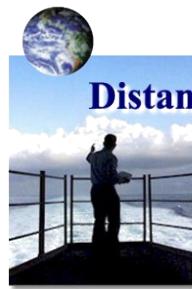
**Anchor Desk**  
I need to . . .

# *What is Unique about Epsilon?*

## *Epsilon sends LESS than the Changes!*



**Document Changes are built from an Index,  
NEW blocks of data and Existing blocks of Data!**



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**Anchor Desk**

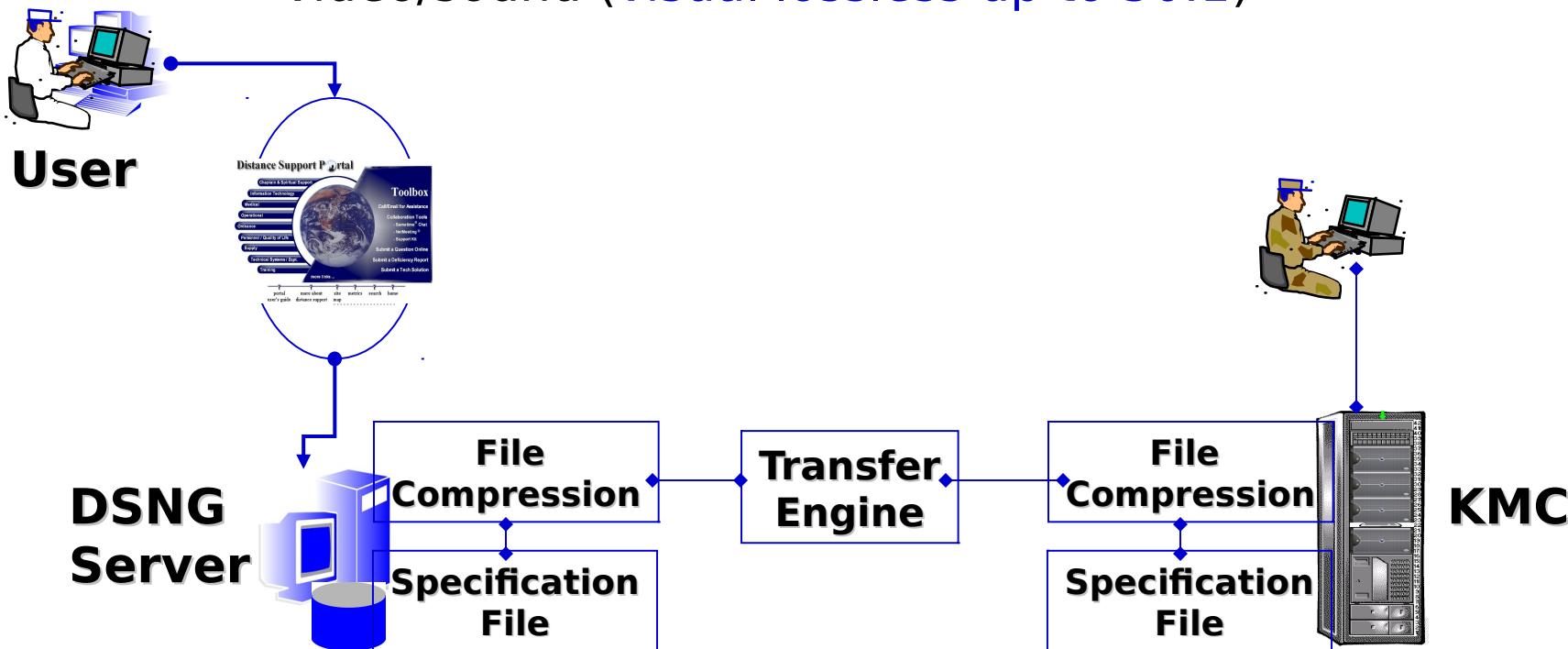
I need to...

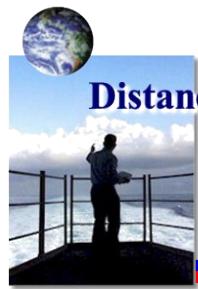
# Data Compression

## NAVSUP Pilot (*Magic-E Software*)

### ➤ Data Compression pilot will:

- ◆ Demonstrate the capability of compressing data, both digital (data lossless up to 10:1) and video/sound (**visual lossless up to 50:1**)





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## Fractal

- Patterns, not original image, are analyzed
- Difficult to compress
- Fast Decompression (from the equations)
- Scalability (interpolates but with errors, distortion)



## JPEG

adjustable, best lossless under 5:1 discrete cos. transforms; leftover is Huffman encoded, blocks artifacts above 30:1,

# Compression Technologies



## Wavelets

- Fourier Math,
- High/Low pass,
- No color edges or color on color
- Goes up to 150:1 quality,
- Uses error tolerant bit-stream



and now  
GalaxyVue's™  
breakthrough  
technology called  
**TDE**, or  
**TEMPORAL  
DIFFERENTIAL  
ENCODING-TDE**





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**Anchor Desk**

I need to . . .

# *GalaxyVue Loss less Compression Ratio 27:1 vs. Original*

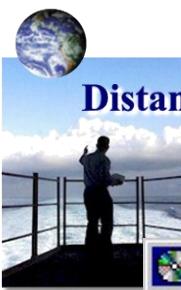
**ClearVue Extra**

File Settings View Image Parameters Clipboard Help

**Impact Imaging Loss less  
1,038,281 bytes**

**Original  
27,786,284 bytes**

\video\impact imaging\presentations\tiger Zoom F2 - F3 Image Density F4 - F5 Brightness F6 - F7 Contrast F8 - F9 File Size 27786284



**Anchor Desk**  
*I need to ...*

# GalaxyVue Lossy Compression Ratio 2800:1 vs. JPEG Lossy Compression Ratio 100:1

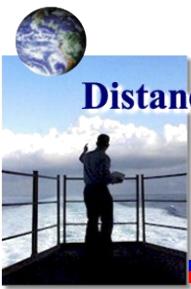
**ClearVue Extra**

File Settings View Image Parameters ClipBoard Help

**Impact Imaging Lossy**  
**9,924 bytes**

**JPEG Lossy**  
**267,782 bytes**

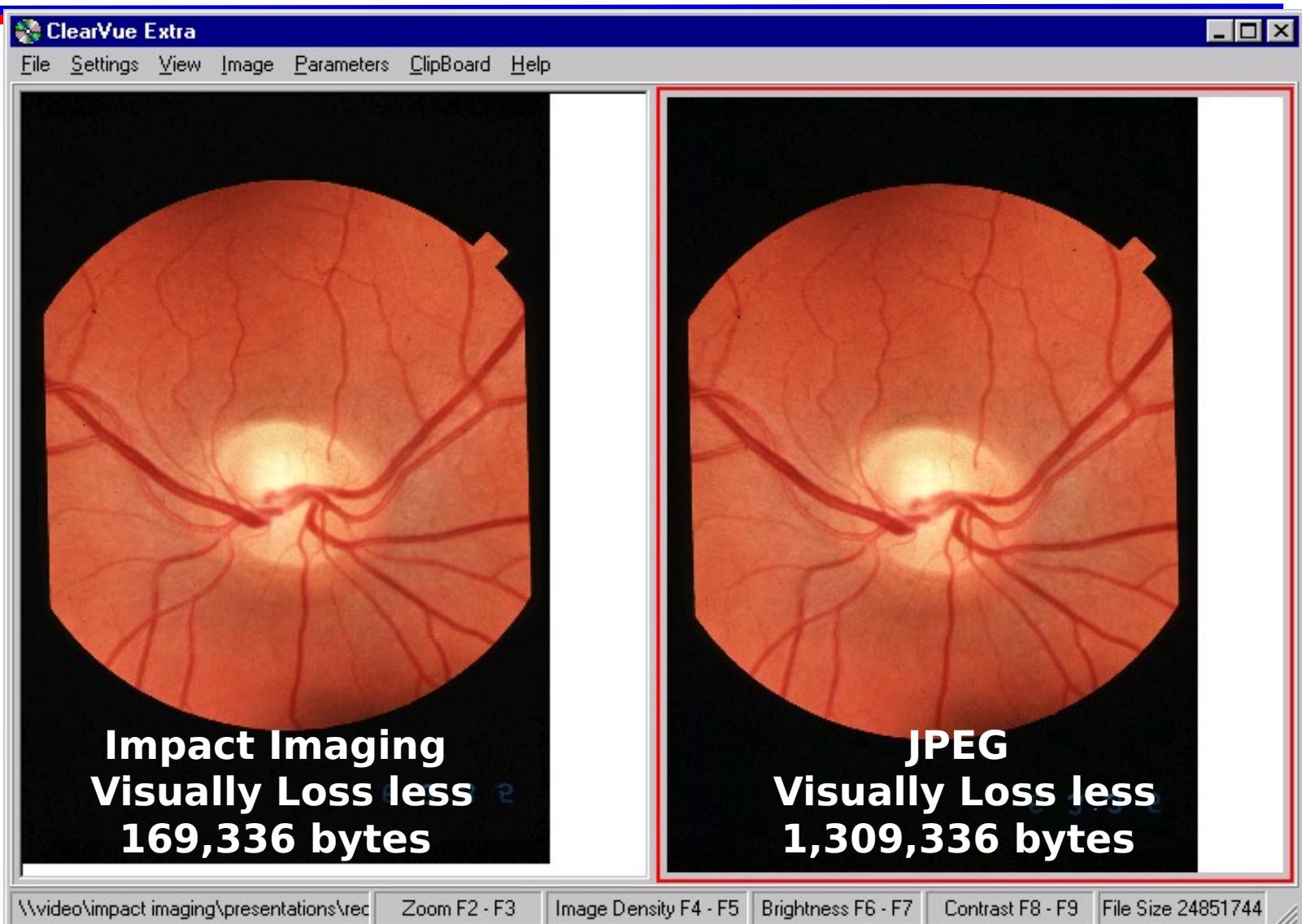
\video\impact imaging\presentations\tiger Zoom F2 - F3 Image Density F4 - F5 Brightness F6 - F7 Contrast F8 - F9 File Size 276782



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*I need to ...*

## *GalaxyVue Visually Loss less Compression Ratio 147:1 vs. JPEG Visually Loss less Compression Ratio 19:1*





**Distance Support**

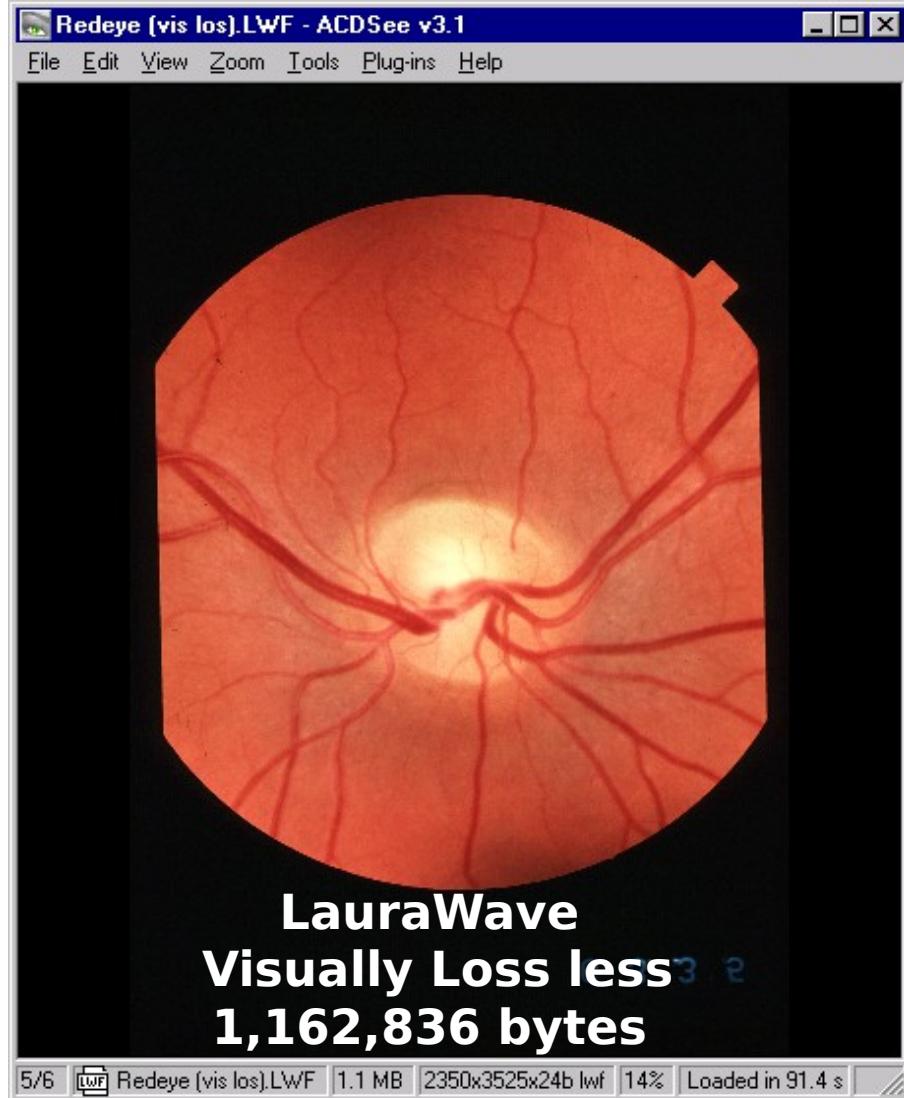
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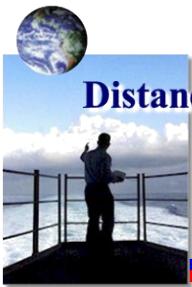


**Anchor Desk**

I need to . . .

# **GalaxyVue Visually Loss less Compression Ratio 147:1 vs. LauraWave Visually Loss less Compression Ratio 21:1**





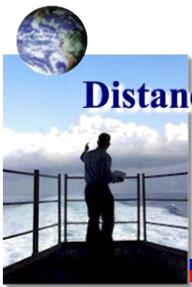
**Anchor Desk**  
*I need to . . .*

# Summary

- Distance Support focus on four bandwidth problem areas
  - ◆ Ship to Ship
  - ◆ Ship to Shore
  - ◆ Intra-Ship
  - ◆ Shore to Shore
- The enabling technologies used for bandwidth mitigation consist of:
  - ◆ Managing what needs to be transported
  - ◆ Managing how it is transported
  - ◆ Managing the preparation and prioritization for transport
  - ◆ Changing processes to alleviate the need for the above
- Teaming and Pilots are continuing at a greater pace
  - ◆ Consideration in design for TFW, NMCI, ERP, JDSR
  - ◆ Teaming with SPAWAR NTCSS, Smartship TSM, CNET NLC
  - ◆ PACFLT and LANTFLT MME initiatives

# Questions





**Distance Support**

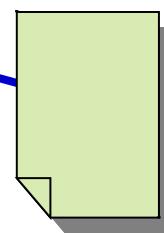
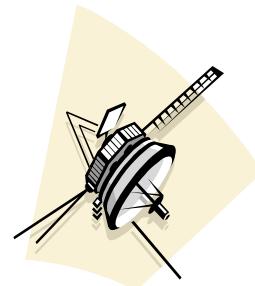
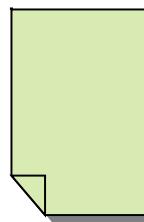
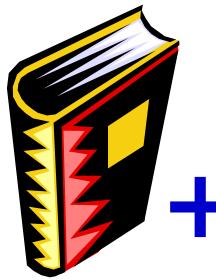
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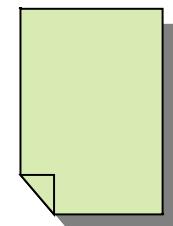
I need to . . .

# Epsilon Technology

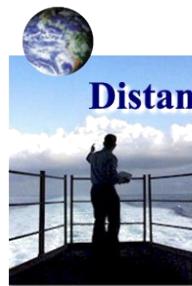
## iOra Publisher



## iOra client Re-builds the manual

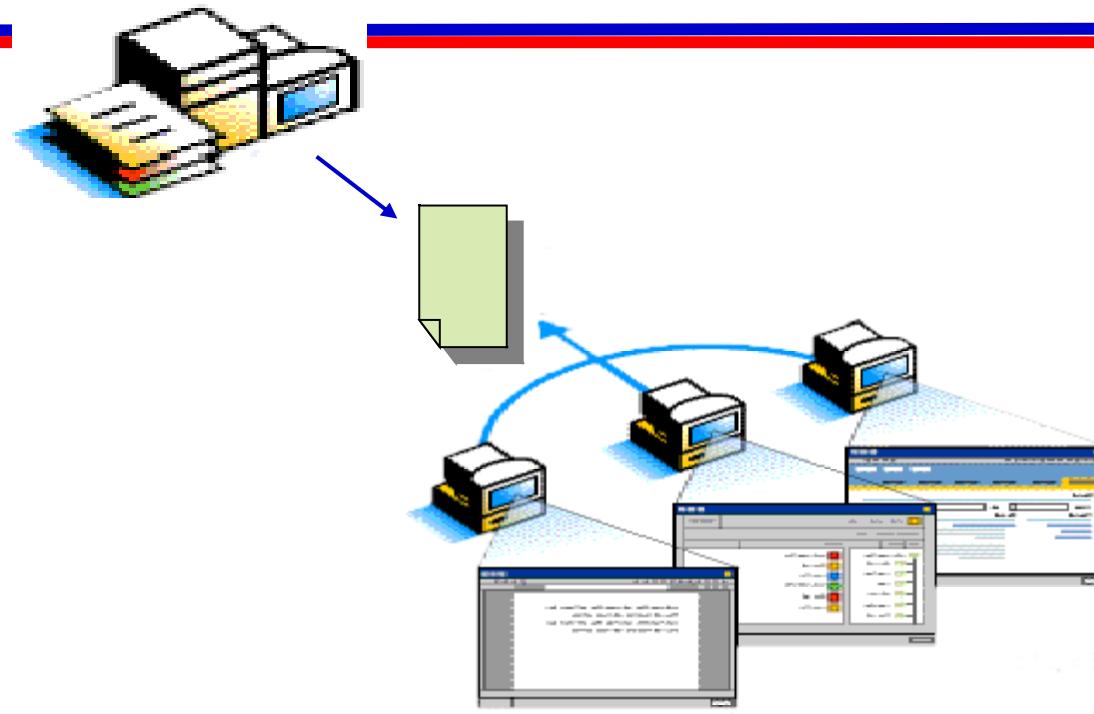


**Only Sending the Changes uses much Less Bandwidth!**



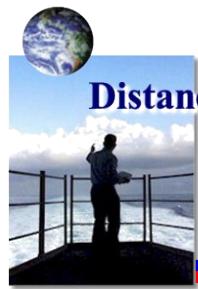
**Anchor Desk**  
*I need to ...*

# *iOra Mobile Intranet for MS SharePoint Portal*



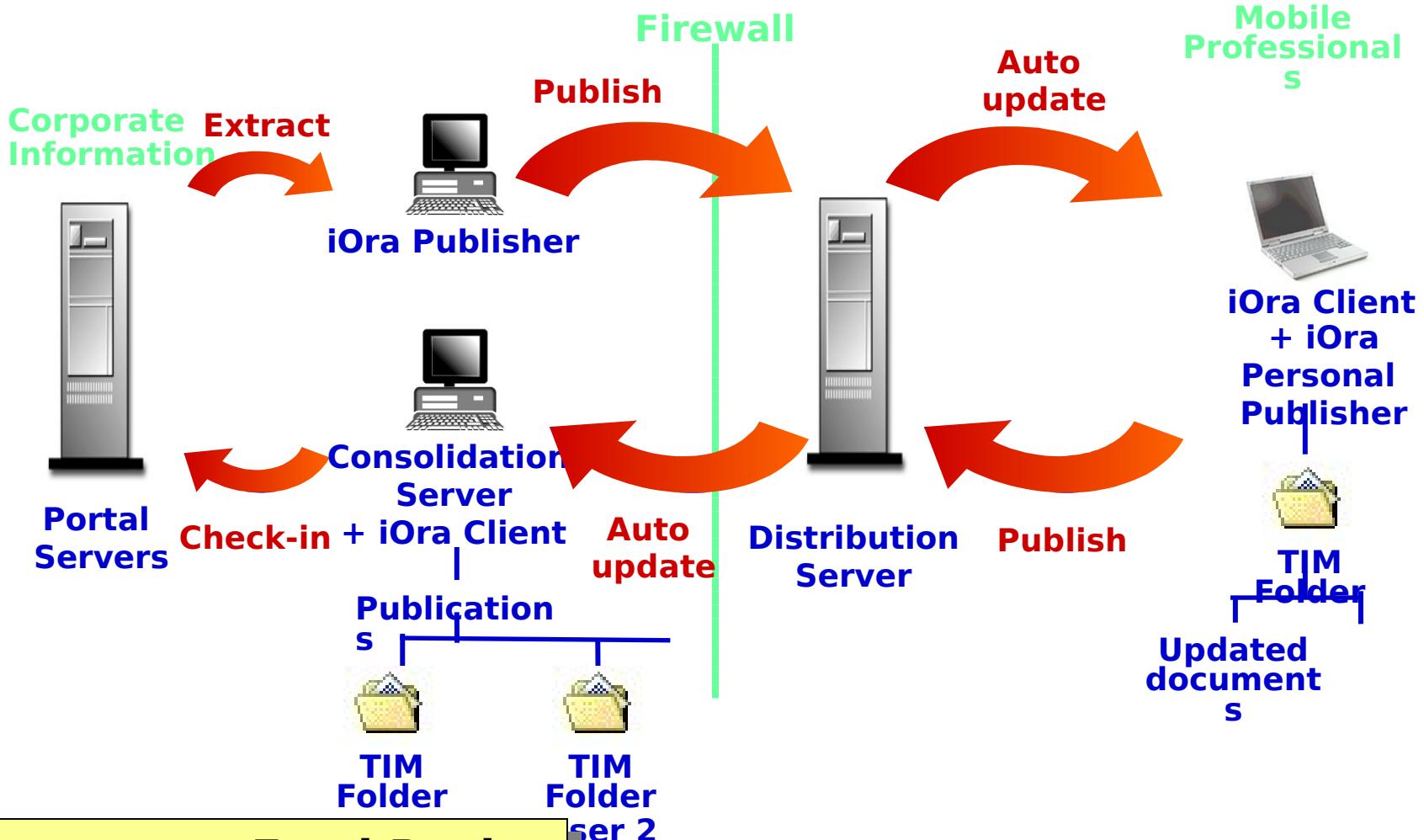
- Portal info Available off Line
- Updates VIA Epsilon
- Off-Line Search Engine

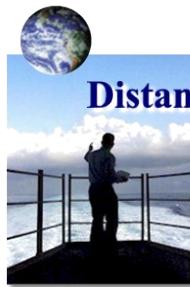
**Take SharePoint Off Line!**



Anchor Desk  
I need to ...

# 2 Way Document Management





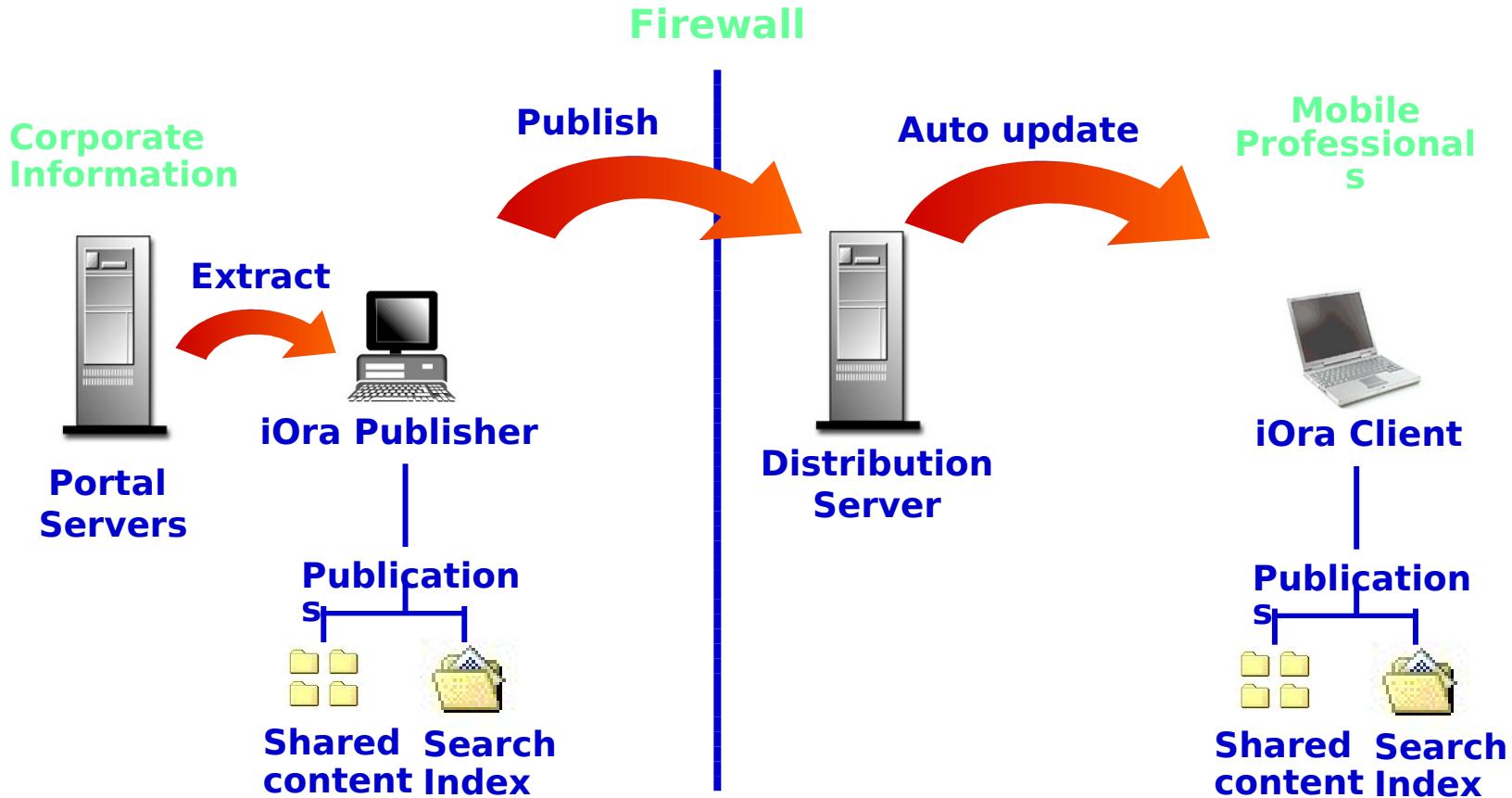
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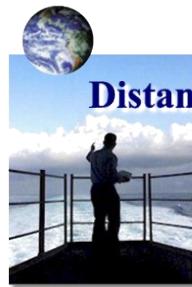
**Anchor Desk**

I need to . . .

# Offline Search



**Search Any Portal Document  
Type....Off Line!**



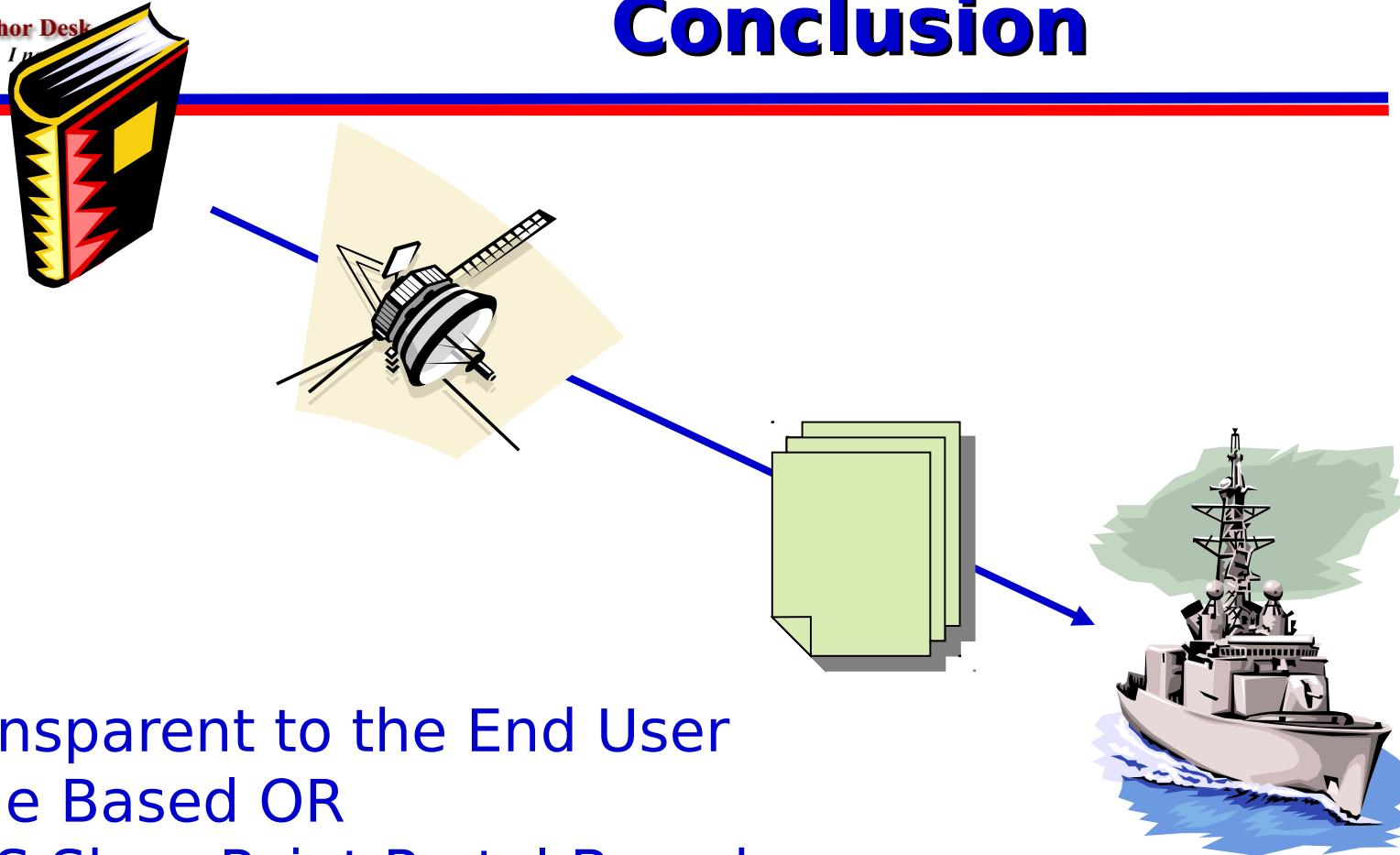
**Distance Support**

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**Anchor Desk**

*I p*

# iOra Mobile Intranet Conclusion



Transparent to the End User

- File Based OR
- MS SharePoint Portal Based
- 10/100 Times faster than normal Compression